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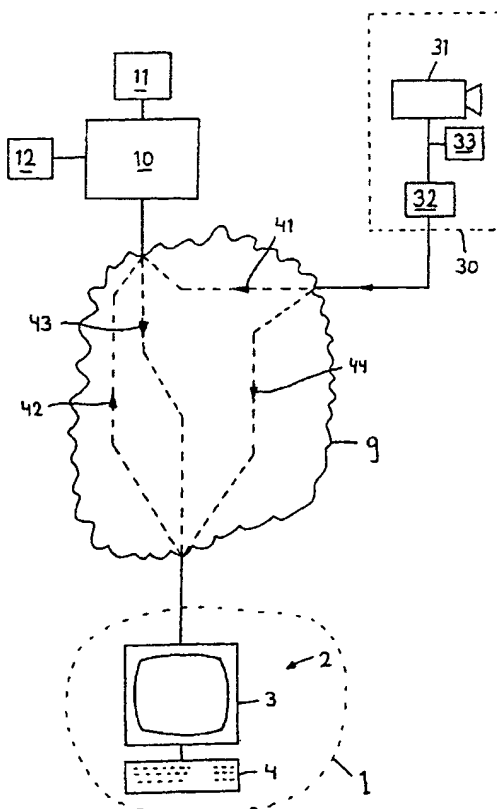
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(54) Title: METHOD AND SYSTEM FOR COMMUNICATING VISUAL INFORMATION



(57) Abstract: A method and system for allowing customers to obtain images from a remote location are described. The system comprises an Internet site (10) and remote cameras (31) connected to the Internet through an interface (32). With the Internet site (10), a memory (11) is associated, in which information regarding the customers and their access permission is stored. When a user wants to see a certain remote location, he contacts the site (10) and enters his particulars. His particulars are compared with the information in the memory (11) to check whether this user is authorised to see this specific location. If so, images from the specific remote camera (31) associated with this remote location is relayed through the Internet to the user, by the Internet site (10).

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

Title:     Method and system for communicating  
          visual information

The present invention relates in general to a system which allows a viewer to view a remote location, in real time.

Such systems are known in the implementation of a dedicated system, where one user is able to view one specific location through the use of one specific camera which is linked to a monitor at the viewer's location by means of a suitable information transfer system, for instance a conductive cable, optical cable, or a wireless communication system. Obviously, such system has limitations, in that the viewer can only view the scene observed by the specific camera from one specific location, i.e. where the monitor is located. Further, it is disadvantageous that a dedicated system needs to be set up for each combination of location to be watched (camera) and location where the viewer can watch (monitor).

An object of the present invention is to provide a system which allows the images generated by a specific camera to be seen by any number of authorized viewers, independent from the location where those viewers are located. Further, the present invention aims to achieve this objective with a minimum of system costs.

Further, the present invention aims to provide a system which is flexible in design, in that the locations which can be viewed as well as the persons who are authorized to view these locations can easily be amended.

According to an important aspect of the present invention, use is made of a computer network, preferably but not exclusively the Internet. Connection between a user and camera is made through one specific Internet site. A user who wants to view a specific scene, enters the scene of his choice, his name, and his personal password or other suitable identification number. The Internet site determines whether this specific user is authorized to view the scene of his request, and if so, the connection to a specific camera is

made. The connection is a one way connection allowing the user to view in real time specific scenes on his computer or other type of viewing apparatus, for instance a telephone with Internet facilities and suitable display.

5 Normally, the connection is for images only, but the connection may be for sound, too.

The invention offers great flexibility in respect of the viewers. Any interested viewer needs only to have an Internet surfing apparatus, normally but not exclusively a personal  
10 computer. The interested viewer needs only to remember one address of one Internet site, independent of the location he wishes to see. The interested viewer needs only to contact this Internet site, and enter his demand. Of course, the system may comprise cameras which are freely accessible to anyone, but  
15 normally access to a camera is restricted to a certain number of authorised persons; therefore, the interested viewer needs to enter his name and authorisation code. This information is also used for billing the viewer.

The invention also offers great flexibility in respect of  
20 the places which can be monitored. Whenever a new location joins the system, all that is needed for the company operating the system is to install a new camera with an Internet interface. Then, through the Internet, communication with this camera is possible from anywhere in the world, always through  
25 said one Internet site and under the exclusive control thereof.

These and other aspects, characteristics and advantages of the present invention will be further clarified by the following description of a preferred embodiment of a control  
30 circuitry in accordance with the invention, with reference to the drawings, in which same reference numerals indicate equal or similar parts, and in which the figures schematically illustrate a computer network.

35 In the figures, a computer network is generally indicated by the reference numeral 9. This computer network 9 is for instance the Internet, although the applicability of the present invention is not limited to the Internet. As is commonly known to persons skilled in the art, the Internet

comprises many Internet sites, each having a unique address, which can be visited by simply typing the desired address in a suitable browser. In fact, such site is implemented by a computer, which can send information through the Internet to a visiting computer. Usually, such information comprises web pages. In the figures, a host computer 10 is shown connected to the Internet, which host computer 10 is responsible for generating an Internet site according to the present invention, indicated with the expression "host site". In the following discussion, however, for the sake of simplicity, no distinction will be made between the concept of Internet sites on the one hand and the physical implementation by means of a computer on the other hand.

The figures also show a user, generally indicated as visitor 1, with a web surfing device which, in the example shown, comprises a personal computer 2 including a monitor 3 and a keyboard 4. However, the present invention is not limited to the use of a PC as web surfing device; instead, the present invention is applicable in the context of any type of web surfing device, such as for instance a mobile telephone with web surfing facilities, a TV-set with a web surfing appliance, a personal digital assistant (PDA), etc. The only condition is that the web surfing device comprises a monitor 3 or can at least be coupled to an associated monitor 3 for displaying images.

The system further comprises at least one, but preferably a large number of, remote stations 30, each remote station 30 comprising a remote camera 31 connected to the Internet 9 through an associated web connecting device or web interface 32, typically a computer. This web interface 32 is designed to catch the image signals from the associated remote camera 31, and to send (41) these signals through the Internet 9 to the host site 10 in a suitable format. Since such web interfaces are known per se, a more detailed description thereof is not necessary here.

If a person wants to subscribe to the visual connection services of said host site 10, he must first register with the company which operates the host site 10. An operator of this company will determine which cameras are accessible to this

subscriber, and will issue an authorisation code to the subscriber. This information is also entered into an authorisation table in a memory 11 associated with the host site 10.

5 Whenever the visitor 1 wants to be connected to a specific remote camera 31, he visits (42) the host site 10, where he will be asked to input information regarding, on the one hand, the remote location 30 he wants to view and, on the other hand, regarding his identity and a password or other identification  
10 number. The host computer 10 verifies the information as received in an authorisation table, to check whether this visitor is authorized to receive images from said specific remote camera 31. If so, the host site 10 relays (43) the image signals as received from the remote camera 31 to the computer 2  
15 of the visitor 1, through the Internet. Thus, the host site 10 may perform a switchboard function. Alternatively, the host site 10 may instruct the web interface 32 associated with the specific remote camera 31 to send (44) the image signals directly to the visitor 1, at least during a predetermined  
20 time.

The communication from host site to visitor will be performed by way of web pages, generated by the host site and displayed on the viewer's monitor 3. In these web pages, the host site may present information to the visitor, and the host  
25 site may ask its questions to the visitor in written form, or by way of fill-in boxes, etc. In order to allow a visitor to re-visit a previously visited camera in a more easy way, the host site 10 may comprise a further memory 12, in which the host site 10 will store the identity of the last N cameras for  
30 each visitor, the number N for instance being equal to 10. When such visitor re-visits the host site 10, the host site may present the visitor a list of recent visits, and the visitor may re-visit a certain camera by clicking or doubleclicking on an item in the list. In case access to such camera depends on  
35 autorisation, the host site will ask the visitor to enter his particulars.

An important advantage of the present invention is that visitors, whether they are authorized or not, can not access a

remote camera 31 directly. On the other hand, even if one would accidentally find the Internet address of any remote camera 31, the web interface 32 associated with that camera 31 would not send image signals to such accidental visitor, because the web  
5 interface 32 is designed to send such signals to the host site 10 only, or to send such signals to specified computers only in response to instructions received from the host site 10. Thus, a visitor 1 can only receive image information from a specific remote camera 31 if authorized by the host site 10. This  
10 authorisation will be given by the host site 10 only if certain conditions are met, depending on the circumstances. These aspects assure that privacy will be respected.

Further, an important advantage of the system according to the present invention is that a large number of remote cameras  
15 31 can be accessed through only one Internet site. Users need only to remember the name of one specific Internet site, advantageously called, for instance, VisualConnect.

Possible applications of the present invention will now be  
20 discussed.

In a first application, one or more cameras 31 are installed to monitor a specific location associated with only one user, for instance his home, his office building, a parking place for his car, etc. From any location in the world, the  
25 user can check whether his house, office, car, etc., respectively, is alright, by connecting to the host site 10 and entering the desired destination and his password. Specifically, cameras may be installed in children's bedrooms; even if one is away from home, one may check whether the  
30 children are alright.

In cases like these, where in principle only one user has access to one specific camera, the user may receive his access code or authorisation code on installation of the camera.

35 Another typical example, where multiple people are potentially allowed to receive the images from a specific camera, is a location where many children are together without their parents usually being present. An example of such situation is a school classroom, a daycare center, etc.

Although the parents may have to leave their children to the care of other people, such as a teacher, a daycare center attendant, etc., and although they normally have full confidence in the capabilities of such other people, parents  
5 feel the need to check upon their children themselves now and then. Such facility is offered by the present invention, too.

If for instance a daycare center wishes to offer this facility to the parents, one or more cameras 31 are installed in such daycare center. Parents receive an authorisation code  
10 upon registration of their child to such daycare center. If these parents feel the need to watch their children, they visit the host site 10 according to the present invention, enter their name and authorisation code, and the images of the daycare center in question are relayed to them.

15 In such a situation, the authorisation of the parents may be restricted to the moments that their children are actually present in the daycare center.

It will be clear to a person skilled in the art that images of the playing children cannot be relayed to  
20 unauthorized persons, simply because these persons do not have the correct authorisation code.

Another typical example regards events which can only be visited by a limited number of people. Examples of such events  
25 are, for instance, sporting events, musical events, etc. If the tickets are sold out, a large number of potential visitors who would in principle be willing to pay for such visit must be disappointed if they can not visit. Also, potentially interested people may be unable to attend because they are  
30 living far away from such event, or for any other reason. However, in accordance with the invention, cameras may be installed at such events, and visitors from all over the world may watch such event in real time, on payment. Thus, not only do those visitors benefit, but also the organisers of such  
35 event may be able to make more money than by selling tickets to a limited number of visitors.

Another typical example regards the processing of a certain personal item along a process line, for instance a



certain product being manufactured on demand for a certain customer. By installing cameras along the process line in accordance with the present invention, such customers may be offered the facility of watching their personal product being processed. Herein, the authorisation code may be issued when the processing of the product is ordered; this information will also be used to connect the customer to the correct camera along the process line, i.e. the camera which momentarily corresponds to the specific product associated with this specific customer.

Another typical example regards the cameras which are installed near motorways in order to monitor the traffic. In principle, these cameras are intended for traffic police, only. However, it is feasible that the images are made available to the public, for instance to allow a driver, before leaving, to check upon the traffic intensity. It may be that the operator of the host site 10 decides to make these images available to everybody free of charge. However, it is also possible that the operator of the host site 10 decides that access is only open for subscribers at a certain fee.

Of course, it is also possible that cameras are installed for showing scenery to remote tourists, for touristical PR purposes.

Another typical example regards cameras which are employed on exploring vehicles such as satellites. It may be that the images provided by these cameras are for internal, scientific use only. The present invention, however, provides a way of making these images available to the public, possibly on a commercial basis.

It is, of course, possible that the host site 10 will show a visitor all possible connections on one page. However, it is preferred that the host site organises the connection possibilities into groups, for instance: "guarding premises"; "schools"; "daycare centers"; "events"; "processes"; "scenery", etc. Then, the host site 10 may present a list of such groups, and the visitor will enter a next web page by choosing a

certain group, i.e. by clicking on a certain item in the list. Further sub-division into further sub-groups, and clicking to further web-pages will be possible.

5 It may be possible that the host site 10 only asks the visitor for an authorisation code if he has selected a camera with restricted access. However, it may also be possible that the visitor is asked to enter his authorisation code first, and that, in the above-indicated web-pages, options will only be presented to him if such options are accessible with his  
10 specific authorisation code (or without needing a code). It may even be possible that the visitor is asked to enter his authorisation code first, and that the host site will understand that the authorisation code corresponds to only one camera and will make the connection automatically.

15

In the above, it has been described that the visitor can watch the images provided by a selected camera in real time. However, it may also be that a visitor wishes to view a certain event after it has happened. For instance, the visitor may wish  
20 to re-view an event a second time, or a plurality of times. It may also be that a visitor wishes to view an event which he was unable to view in real time. In order to provide such facility, cameras 31 may be equipped with a memory 33 in which images (footage) can be recorded and kept for a predetermined time,  
25 preferably at least a number of days. If the host site receives a request from a visitor to view a recorded event, the host site will instruct the remote location 30 to send these recorded images over the network 9.

30 Billing for the facilities offered by the present invention may be done in several ways. For instance, it is possible that the user pays a fixed amount of contribution to the host site 10, for having the facility available, whether or not the facility is used at all. This type of billing scheme  
35 may be adequate in cases where there exists a one-to-one relationship between a visitor and a camera, for instance in the above-described example of cameras guarding the premises of a user.

In other examples, the user may be billed for each image connection set up on his request through the host site 10, or for the amount of time such connection lasts. In both cases, billing may be combined with a fixed amount of subscription.

5

In the above, the invention is explained for a configuration where each camera is directly connected to the network 9, and where the designation of a certain camera based on a visitor's request is fully made by the host site 10. As an alternative, it is also possible that a plurality of cameras 10 31<sub>1</sub>, 31<sub>2</sub>, 31<sub>3</sub>, etc. is accessible through a group site 50, as illustrated in figure 2. Such a configuration will apply in cases where the actual designation of a specific camera is done by an operator (group site 50) of the group of cameras, 15 depending on local circumstances. Then, the host site will connect to the group site 50, which will connect to a specific camera 31.

Then, individual interfaces 32 may be associated with the individual cameras 31 of the group, each individual interface 20 32 being connected between the corresponding camera 31 and the group site 50. However, it is also possible that a common interface 32 is connected between the group site 50 and the network 9.

An example of a situation where such configuration might 25 be advantageous is a children daycare center where the children may be present in different rooms; then, the group site 50 may act as a kind of switchboard and connect the visitor to the specific camera located in the specific room in which the child of this specific visitor is momentarily present.

30 Another example regards processing a product along a process line. The group site 50 associated with the process line will know where the specific product belonging to the specific customer is located, and will know which camera to activate.

35 Similarly as described above, each camera 31<sub>1</sub>, 31<sub>2</sub>, 31<sub>3</sub>, etc. of such group may be equipped with an associated memory 33<sub>1</sub>, 33<sub>2</sub>, 33<sub>3</sub>, etc., respectively.

In the above, it is explained how the visitor can connect to a camera in accordance with the present invention. It is, however, emphasized that the present invention is not restricted to a visitor making contact with one camera only. Instead, it is also possible that the visitor connects to two or more cameras simultaneously, either in one request or in a number of subsequent requests. Each time the visitor makes a next request, the host site can ask the visitor whether he wants to continue his previous connection or whether he wants to disconnect.

Then, when the visitor is connected to two or more cameras simultaneously, which means that the images from two or more cameras are received by his web surfing device simultaneously, he has the option to watch the images of only one camera on his monitor 3, and to switch between cameras as desired. However, he also has the option of watching the images from two or more cameras on one monitor, at the same time. To this end, the visitor may use known per se techniques such as split screen or multiple screen, wherein certain areas of his monitor screen are defined and reserved for projecting the image of one camera. These areas may be ordered as desired, for instance above each other, next to each other, partly behind each other, etc. The areas may be any desired shape, for instance rectangular, circular, etc. The areas may be of different size. Further, the form and size may be amended at any time, as desired.

Thus, the present invention offers the user the possibility of watching a plurality of scenes at the same time, which is for instance advantageous in the case of a user who has two or more children staying in a daycare center, and who wants to see his children simultaneously.

Still further, the invention offers the user the possibility of receiving images from cameras. However, the invention does not require the user to dedicate his complete web surfing device to watching camera images. For instance, if the user uses a personal computer 2, he may run any computer programme such as for instance a text processing programme, and have one or more areas of his screen reserved for watching

images from one or more cameras. In the exemplary case where the user sees his children play at a daycare center, such areas may be considered as constituting a moving picture.

5           Thus, the present invention succeeds in providing a method and system for allowing customers to obtain images from a remote location. The system comprises an Internet site 10 and remote cameras 31 connected to the Internet through an interface 32. With the Internet site 10, a memory 11 is  
10 associated, in which information regarding the customers and their access permission is stored. When a user wants to see a certain remote location, he contacts the site 10 and enters his particulars. His particulars are compared with the information in the memory 11 to check whether this user is authorised to  
15 see this specific location. If so, images from the specific remote camera 31 associated with this remote location is relayed through the Internet to the user, by the Internet site 10.

20           It should be clear to a person skilled in the art that the scope of the present invention is not limited to the examples discussed in the above, but that several amendments and modifications are possible without departing from the scope of the invention as defined in the appending claims. Especially,  
25 other applications of the present invention are feasible.

12  
CLAIMS

1. Visual connection system, comprising:  
a computer network (9), preferably the Internet;  
a site (10) on said network (9);  
at least one remote station (30), comprising a remote camera  
5 (31) connected to said network (9) through an interface (32);  
a memory (11) associated with said site (10), containing user  
authorisation information;  
wherein the interface (32) is designed to send (41) image  
signals generated by the associated camera (31) to said site  
10 (10) through said network (9);  
wherein the site (10) is designed to receive requests (42) from  
users (1) through said network (9), the request comprising  
destiny information relating to a specific camera (31) and  
authorisation information relating to the user;  
15 wherein the site (10) is designed to compare the information in  
the user request with the information in said memory (11) and  
to decide whether the requesting user (1) is authorised to  
receive image signals from said specific camera (31);  
and wherein the site (10) is designed to relay (43) the image  
20 signals from said specific camera (31) to said requesting user  
(1) through said network (9) if it is decided that said  
requesting user (1) is so authorised.
2. System according to claim 1, wherein the site (10) is  
25 designed to, instead of relaying the image signals, instruct  
said specific camera (31) to communicate (44) the image signals  
directly to said requesting user (1) through said network (9),  
in real time.
- 30 3. System according to claim 1 or 2, wherein the site (10) is  
associated with a memory (12) for storing information regarding  
recent visits of the visitors.
4. System according to claim 1 or 2, wherein at least one  
35 camera (31) is associated with a memory (33) for storing  
footage.

5. System according to claim 4, wherein the remote station (30) is designed to, on request, send image signals from said associated memory (33) to said site (10) or to the requesting visitor, respectively.

6. System according to claim 1 or 2, wherein a plurality of cameras (31<sub>1</sub>; 31<sub>2</sub>; 31<sub>3</sub>; ... ) are connected to said network (9) through a group site (50).

7. System according to claim 6, wherein the group site (50) is designed to, on request, send image signals from at least one of the associated cameras (31<sub>1</sub>; 31<sub>2</sub>; 31<sub>3</sub>; ... ) to said site (10) or to the requesting visitor, respectively.

8. System according to claim 6, wherein at least one camera and preferably all cameras of said plurality of cameras (31<sub>1</sub>; 31<sub>2</sub>; 31<sub>3</sub>; ... ) are provided with an associated memory (33<sub>1</sub>; 33<sub>2</sub>; 33<sub>3</sub>; ... ) for storing footage.

9. System according to claim 8, wherein the group site (50) is designed to, on request, send image signals from at least one of the associated memories (33<sub>1</sub>; 33<sub>2</sub>; 33<sub>3</sub>; ... ) to said site (10) or to the requesting visitor, respectively.

10. System according to any of the previous claims, wherein the site (10) is designed to receive a plurality of requests (42) from a user, corresponding to a plurality of cameras, and wherein the site (10) is designed to relay (43) the image signals from said plurality of cameras to said requesting user simultaneously or, alternatively, to instruct each of said cameras to communicate their image signals directly to said requesting user.

11. Method for setting up a one-way communication connection between a user (1) and a remote camera (31); wherein the remote camera (31) is connected to a network (9), preferably the Internet, through an interface (32); wherein the interface (32) sends (41) image signals generated

- by the associated camera (31) to a control means (10) through said network (9);  
wherein the user (1) sends (42) a request through said network (9) to said control means (10), the request comprising destiny  
5 information relating to a specific camera (31) and  
authorisation information relating to the user;  
wherein the information in the user request is compared with  
information in a memory (11), and wherein is determined whether  
the requesting user (1) is authorised to receive image signals  
10 from said specific camera (31);  
and wherein the image signals from said specific camera (31)  
are relayed (43) to said requesting user (1) through said  
network (9) if it is decided that said requesting user (1) is  
so authorised.
- 15
12. Method according to claim 11, wherein the image signals  
from said specific camera (31) are sent (44) directly to said  
requesting user (1) through said network (9) if it is decided  
that said requesting user (1) is so authorised.
- 20
13. Method according to claim 11 or 12, wherein the control  
means (10) shows the user (1) a list containing a number (N) of  
previous visits, and wherein the user makes his request by  
selecting one item from the list, for instance by clicking or  
25 double-clicking on said item.
14. Method according to claim 13, wherein the required site is  
opened immediately after the user has made his request by  
selecting one item from the list.
- 30
15. Method according to claim 13, wherein, after the user has  
made his request by selecting one item from the list, the user  
is first asked to input his authorisation code, and the  
required site is opened immediately after verification shows  
35 that the authorisation code is valid.
16. Method according to claim 13,  
wherein the user is first asked to input his authorisation  
code;



wherein, after verification shows that the authorisation code is valid, the control means (10) shows the user (1) a list containing a number (N) of previous visits for which his authorisation code is valid;

5 wherein the user makes his request by selecting one item from the list, for instance by clicking or double-clicking on said item;

and wherein the required site is opened immediately after the user has made his request by selecting one item from the list.

10

17. Method according to claim 11 or 12, wherein the image signals from a specific camera (31) are stored in a memory (33);

wherein the user (1) requests to watch past events;

15 and wherein the signals are read from said memory (33) and sent to said user (1).

18. Method according to claim 11 or 12, wherein the host site (10), in response to a user request, connects the user with a  
20 group site (50) associated with a plurality of cameras (31<sub>1</sub>, 31<sub>2</sub>, 31<sub>3</sub>, ...), and wherein the group site (50) connects the user with a specific one of said associated cameras.

19. Method according to claim 11 or 12, wherein the host site  
25 (10), in response to a user request, connects the user with a group site (50) associated with a plurality of cameras (31<sub>1</sub>, 31<sub>2</sub>, 31<sub>3</sub>) equipped with associated memories (33<sub>1</sub>, 33<sub>2</sub>, 33<sub>3</sub>); wherein the image signals from a specific camera (31<sub>1</sub>, 31<sub>2</sub>, 31<sub>3</sub>) are stored in the corresponding memory (33<sub>1</sub>, 33<sub>2</sub>, 33<sub>3</sub>);  
30 wherein the user (1) requests to watch past events;  
wherein the group site (50) connects the user with a specific one of said memories (33<sub>1</sub>, 33<sub>2</sub>, 33<sub>3</sub>);  
and wherein the signals are read from said specific one of said memories (33<sub>1</sub>, 33<sub>2</sub>, 33<sub>3</sub>) and sent to said user (1).

35

20. Method according to claim 11 or 12, wherein the user sends a plurality of requests, corresponding to a plurality of cameras, and wherein the image signals from said plurality of

cameras are relayed (43) or sent (44) directly to said requesting user simultaneously.

21. Method according to claim 20, wherein image signals from a  
5 plurality of cameras are projected on a screen simultaneously.

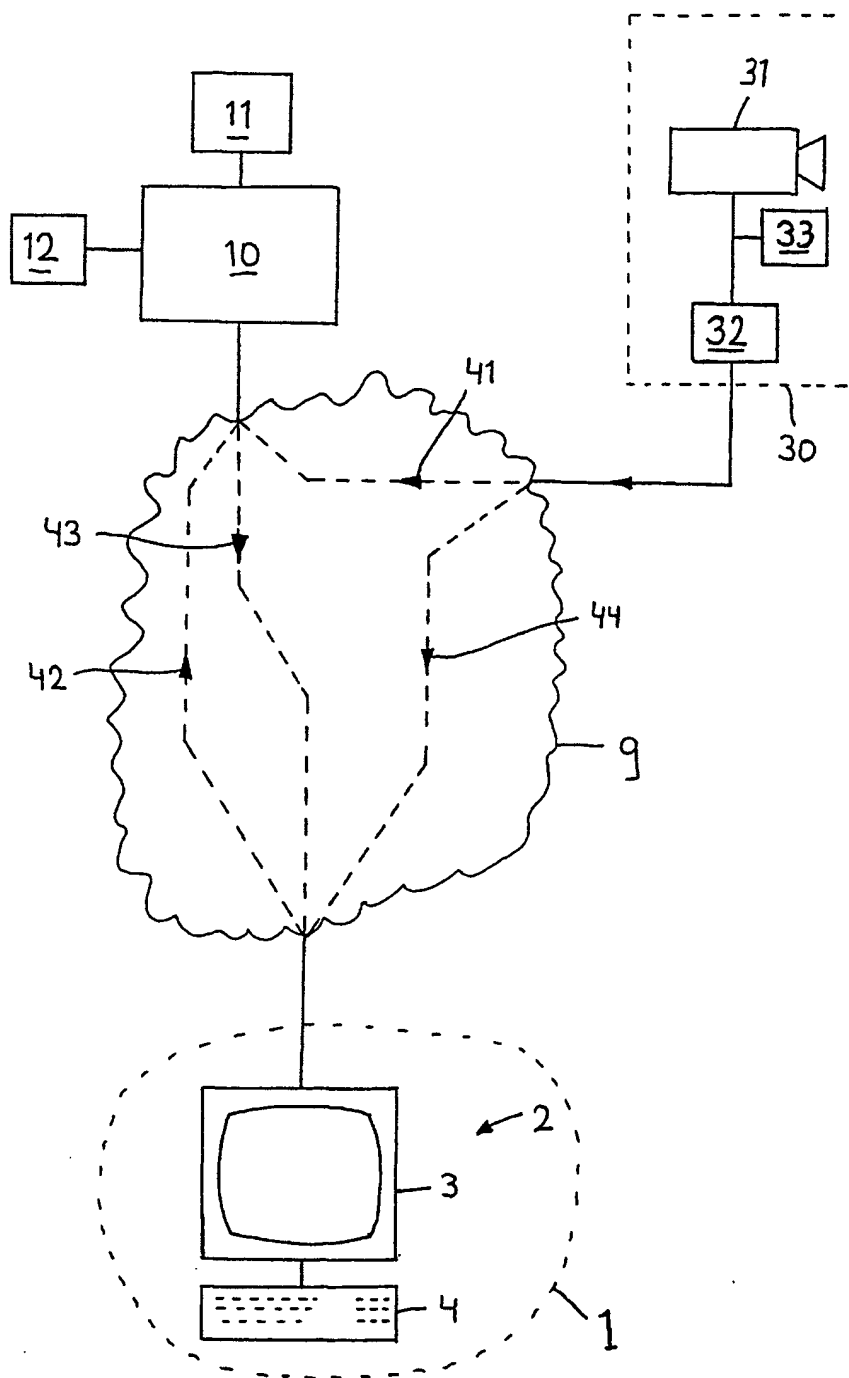


FIG. 1

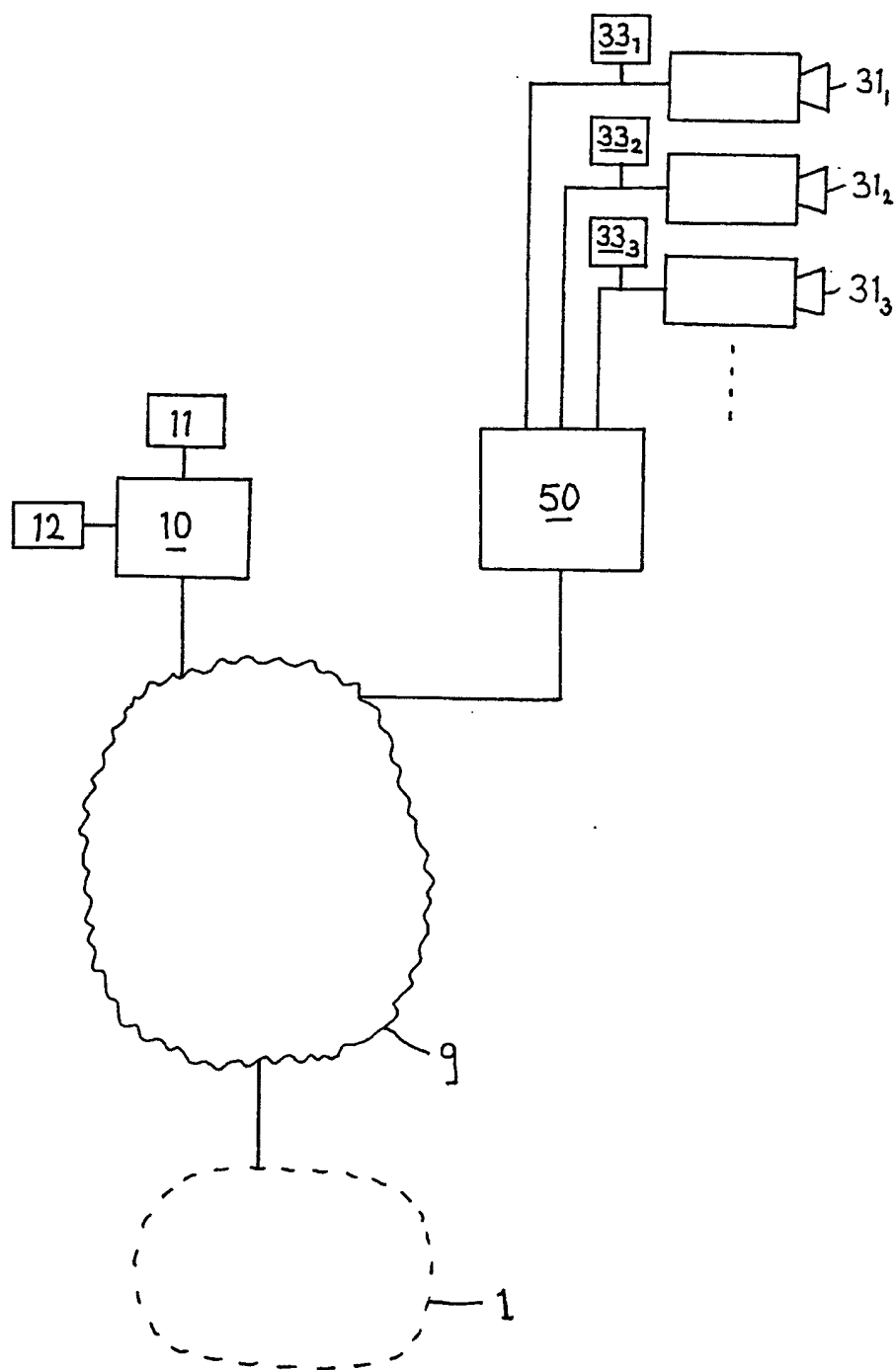


FIG. 2

## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/EP 00/06582

A. CLASSIFICATION OF SUBJECT MATTER		
IPC 7	H04L29/06	H04N7/18 H04L12/28 G0965/14
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC 7 H04L H04N H04M		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
EPO-Internal, PAJ, WPI Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Date of the actual completion of the international search		Date of mailing of the international search report
5 September 2001		24/09/2001
Name and mailing address of the ISA European Patent Office, P.B. 5618 Patentlaan 2 NL - 2280 HV Rijswijk Tel (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016		Authorized officer  Kalabic, F

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